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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,900	12/16/2003	Kenta Ogawa	8001-1183	5711

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EXAMINER

ZIMMERMAN, JOHN J

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/735,900

Applicant(s)

OGAWA, KENTA

Examiner

John J. Zimmerman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/21/05 (election).
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-10 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1,2 and 5-10 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20031216.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FIRST OFFICE ACTION

Election/Restrictions

1. Applicant's election without traverse of the Tin-Bismuth thin film species in the reply filed on October 21, 2005 is acknowledged. Elected claims 1-2 and 5-10 are pending in this application. Non-elected species claims 3-4 have been cancelled.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The Information Disclosure Statement received December 16, 2003 has been considered. An initialed form PTO-1449 is enclosed with this First Office Action.

Claim Rejections - 35 USC § 102/103

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-2, 5-6 and 8-9 are rejected under 35 U.S.C. 102(b) as anticipated by Nishikawa (JP 2001-053211).

7. Nishikawa discloses that the prior art semiconductor devices had lead material having a Sn-Bi plating layer on the lead material containing 3-5% Bi and having a thickness of about 10 microns (e.g. see paragraph [0003]; Figure 3). Nishikawa's specifically disclosed prior art endpoint of 5% Bi and prior art plating thickness of about 10 microns fall directly in conditional expression "(c)" of independent claim 1 and conditional expression "(a)" of independent claim 2. In view of the fact that Nishikawa specifically discloses the 5% Bi endpoint of bismuth content in the tin alloy, the applicant's claims are disclosed with sufficient specificity to be anticipated. See MPEP 2131.03. Regarding the claim limitation requiring a "plurality of external terminals each having a base terminal" (e.g. claim 1, lines 2-3; claim 2, lines 2-3) and the limitation that the base material is a "conductive material" (e.g. see claims 6 and 9), even though Nishikawa may not discuss the conductivity or illustrate the entire leadframe in the figures, one of ordinary skill in the art understands that semiconductor device leadframes in the prior art are conductive

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and have a plurality of external terminals to connect the semiconductor chip to the circuit board.

The level of ordinary skill in the art *must* be taken into account when considering the prior art and one of ordinary skill in this art is familiar with a leadframe configuration and therefore it is not necessary that Nishikawa describe or illustrate such conventional prior art configurations in detail.

8. Claims 1-2 and 5-10 are rejected under 35 U.S.C. 103(a) as obvious over Nishikawa (JP 2001-053211) in view of Sugihara (U.S. Patent 6,392,293).

9. Nishikawa discloses that the prior art semiconductor devices had lead material having a Sn-Bi plating layer on the lead material containing 3-5% Bi and having a thickness of about 10 microns (e.g. see paragraph [0003]; Figure 3). Nishikawa's specifically disclosed prior art endpoint of 5% Bi and prior art plating thickness of about 10 microns fall directly in conditional expression "(c)" of independent claim 1 and conditional expression "(a)" of independent claim 2. In view of the fact that Nishikawa specifically discloses the 5% Bi endpoint of bismuth content in the tin alloy, the applicant's claims are discloses with sufficient specificity to be anticipated. See MPEP 2131.03. In any event, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 USPQ 549. Regarding the claim limitation requiring a "plurality of external terminals each having a base terminal" (e.g. claim 1, lines 2-3; claim 2, lines 2-3) and the claim limitation that the base

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material is a "conductive material" (e.g. see claims 6 and 9), even though Nishikawa may not discuss the conductivity or illustrate the entire leadframe in the figures, one of ordinary skill in the art understands that semiconductor device leadframes in the prior art are conductive and have a plurality of external terminals which connect the semiconductor chip to the circuit board. The level of ordinary skill in the art *must* be taken into account when considering the prior art and one of ordinary skill in this art is familiar with standard leadframe configurations and therefore it is not necessary that Nishikawa describe or illustrate such conventional prior art configurations in detail. In any event, Sugihara is applied to clearly show that a conventional lead frame configuration comprises a plurality of leads for connecting a semiconductor device to a circuit board and that the standard leadframes are conventionally made from copper alloys or iron-nickel alloys (e.g. see column 5, line 54 - column 6, line 5). In view of Sugihara, it would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the leadframe of Nishikawa with a plurality of lead terminals and to use a copper alloy or iron-nickel alloy because Sugihara shows that standard leadframes in the art are indeed constructed in this manner.

10. Claims 1-2 and 5-10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Okudaira (JP 2002-141456).

11. Okudaira discloses semiconductor device lead materials having a Sn-Bi lower plating layer (7) containing 0.5 to 6 wt.% Bi and having a thickness of about 10 micrometers (e.g. see paragraphs [0012], [0028]). Okudaira's specifically disclosed prior art endpoint of 6% Bi and

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plating thickness of about 10 micrometers fall directly in conditional expression "(c)" of independent claim 1 and conditional expression "(a)" of independent claim 2. In view of the fact that Okudaira specifically discloses the 6 wt.% Bi endpoint of bismuth content in the tin alloy, the applicant's claims are disclosed with sufficient specificity to be anticipated. See MPEP 2131.03. Regarding the claim limitation requiring a "plurality of external terminals each having a base terminal" (e.g. claim 1, lines 2-3; claim 2, lines 2-3) and the limitation that the base material is a "conductive material" (e.g. see claims 6 and 9), Okudaira discloses a multiple lead device (e.g. see Figure 1) and discloses that the leadframes can be made of copper alloy or iron-nickel alloy (e.g. see paragraph [0016]).

12. Claims 1-2 and 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimokawa (U.S. Patent Application Publication 2002/0019077).

13. Shimokawa discloses semiconductor device lead materials having a Sn-Bi plating layer (e.g. see Figure 1) containing 5 wt.% Bi which is plated directly on the base member (e.g. see examples in Figures 4-8). As shown in the specification's Examples 1 and 2 (e.g. see paragraphs [0052]-[0053]), iron-nickel alloy is considered a standard lead material by Shimokawa.

Shimokawa may differ from the claims in that Shimokawa may not disclose a specific Sn-Bi layer plating thickness for the Sn-5 wt.% Bi alloy (which has been plated directly on the base member) as shown in Figures 4-8. Shimokawa, however, does disclose examples of plating Sn-Bi plating layers containing 5 wt.% Bi in thicknesses of about 10 micrometers on an intermediate copper layer (e.g. see paragraphs [0053]) and also does show plating other Sn-Bi alloy layers

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directly on the base member in a thickness of about 10 micrometers (e.g. see paragraph [0052]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to plate the directly plated Sn-Bi alloy layers (having 5 wt.% Bi) of Shimokawa in a thickness of about 10 microns since Shimokawa shows this to be standard thickness for his plated Sn-Bi layers in his examples. Shimokawa's example of Sn-5% Bi at a plating thickness of about 10 micrometers would fall directly in conditional expression "(c)" of independent claim 1 and conditional expression "(a)" of independent claim 2.

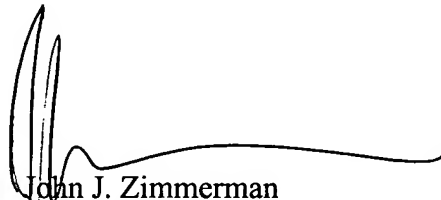
Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional art of record serves to further establish the level of ordinary skill in the art at the time the invention was made.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John J. Zimmerman
Primary Examiner
Art Unit 1775

jjz
December 29, 2005